WILDLIFE FEBRUARY 1988 ONE DOLLAR



Rob was down in the mouth yesterday. Acted like a dog off its feed. I couldn't even get him to laugh about our last deer hunting exploit when he got distracted by a flock of turkeys and tried sneaking up on them in a field on his belly like he was antelope hunting.

A friend of mine who is married to one heckuva deer hunter started fussing the other day when her husband just up and left for the woods on his day off. Didn't do a single household chore set out for him. And he didn't take his gun with him, even though the season was still open then. Just took off. Typical.

It's an ache or a frown, or a sudden flash of temper. It happens soon after deer season closes and the snow starts falling. Ducks are still in, geese and quail and grouse, too. But you've lost heart. The sea-

son has stopped dead.

It's not just that a good thing has come to an end again, as we know things like that must. Because, I think most of us could handle that sort of situation in a dignified manner with only a few minor days of sulking. No, it's much more than that.

It's having to let go of the cold sunrises, and the single stars that still hold brightness at 7:00 a.m., and whispering to each other while you're peering into the woods from atop a hill, ready to see a deer slip into a field on its way into cover. It's being warm and still in the morning, full up with coffee shared in a farmhouse 10 minutes ago



with a new friend who is grinning about the whole day laid clean out

in front of you. . .

Get yourself up into that edge of woods that borders the clearcut and runs down to the edge of that creek. You might see something once the dogs season. Make this one count. Don't start running. Mapping out your stand, you pace off the yards down to the creek, then fix in your mind the tree that marks your gun's limit, beyond which you won't shoot. And leaning up against a mouth, and a blood-dipped pine tree, waiting, with the sun moving up through the trees, you shift after the kill, because it all had to positions so that the sun glinting off your barrel won't spook that powerful love. two-step rustle in the leaves. . .

It's losing the midmorning regrouping, when everybody goes harder to tear yourself away from back to the trucks for some coffee, and then starts kicking around ideas about exactly where the first find something else that will at least man drive of the day should be. And those times when you find yourself scrunched up in a tree stand with your hunting buddy. some new land. But, it's easier to He's facing one way, you're facing despair. the other. Psst! Nudge me if you see something. The hooting and hollering of the drivers, the whoops and groans when they hit briars and tear their legs up, all so's you'll get a deer this time.

And it's the loss of those quiet. easy conversations at midday, sitting on a log somewhere in the sun and swapping sandwiches and Cocacolas, and bringing up matters of the heart and soul, and digging out answers in the warmth of a December afternoon.

It's the ache of losing your grip on those kinds of bonds made fast with the season, hoping they'll hold through another year, until the buck rubs, the scrapes, and the

signs appear again. . .

It's gonna be your last stand this mess up. The light is fading, and the deer step out, one first, then another and another. One shot, and night closes in cold and clear, with a pine bough ritually placed in a doe's branch laid gently on a gray body do with thanks and respect and a

It's not an easy thing to accept the end of something. And it's even the memories and face the fact that you're just going to have to try to make life bearable for the next unmentionable number of months, like buying a new rifle or scouting

And that's mostly what we do till the leaves turn green and the chill dulls and something stirs inside

Still, we won't be right again till September.

Dedicated to the Conservation of Virginia's Wildlife and Related Natural Resources



over

Snow geese (Chen caerulescens); photo by R.C.

Back cover: Virginia mountain stream; photo by Jean M. Fogle.

4 Bombers in the East by Joe Coggin Ruffed grouse are being reintroduced into eastern Virginia by the Game Department, and so far, the results look promising.

Backing Our Brookies 1 by Christopher Camuto A management program for brook trout in Virginia.

Stalking the Snow Goose by Bob Gooch Hunters are learning fast how to hunt these birds. I





- 22 On the WILD side by Nancy Hugo Virginia's Project WILD is bringing wildlife conservation into our schools—and it's fun.
- 26 Fast Food For Frugivores by Nancy Hugo Cedar berries come in handy for migrating birds taking their meals on the wind.

From the Backcountry Planting for Wild- 30 life, boating safety tips, recipes, hunter education courses, and more.

- Virginia's Wildlife by John Pagels The Fisher



any years ago, we at the Game Department learned that trying to establish wildlife species in new areas by raising them on a game farm and then releaseing them into the wild was destined to fail. However, research and experimentation, especially with wild turkeys, taught us that capturing birds in the wild and then releasing them in areas of the state that appeared to have good habitat could be extremely successful. As a matter of fact, as the result of our turkey stocking program, we have only 16 counties in the state left that do not boast a fall turkey hunting season, and turkeys all across the state are becoming a common occurrence.

But what about ruffed grouse? Except for the counties located just east of the Blue Ridge Mountains, there are few grouse to be found throughout the state, and none in Tidewater. Realizing this, we started investigating the possibility of relocating grouse in eastern Virginia. We had no firm evidence that the bird historically inhabited the region, although reports have indicated that ruffed grouse are naturally moving eastward, with wild birds being sighted on Fort Pickett Military Reservation in Nottoway, Brunswick and Dinwiddie counties.

Thus, in 1985, the Game Department made the decision to attempt a relocation effort of ruffed grouse into eastern Virginia. We decided to conduct the research project on the Chickahominy Wildlife Management Area (WMA) in Charles City County, located approximately 30 air miles southeast of Richmond. Since it is Game Department owned land, we would have control over timber cutting and other management practices to maintain and improve grouse habitat there.

After reviewing the literature and evaluating the experiments of grouse

Bombers in the East

Ruffed grouse are being reintroduced into eastern Virginia by the Game Department, and so far, the results look promising.

by Joe Coggin

FEBRUARY 1988



relocation in other states, particularly in Missouri, Wisconsin, and Arkansas, we decided to attempt a relocation of 60 wild trapped birds. That's when the work began. Finding grouse is hard enough, but trapping them is a monumental effort. The Game Department Wildlife Management Area Supervisors located west of the Blue Ridge Mountains were involved in the trapping project that summer and fall of 1985. Each supervisor constructed 20 traps, which gives you some idea of the odds of capturing a bird.

By the last week in August, the traps were complete, and with persistence and hard work that lasted more than two months, the men caught 66 birds. Six of the birds died, mostly due to injuries sustained in the traps or holding pens. Three escaped, and we were left with 57 grouse (31 males and 26 females) to release on Chickahominy WMA.

Once trapped, no bird was kept more than 24 hours, and all were banded and then released before 9:00 each morning. Prior to the release of any birds, we identified a 600-acre release area, chosen with the assistance of our biologists and the Ruffed Grouse Society. We were looking for an area with small sapling size trees, some conifers, and fairly dense understory near openings and clearings. Cutover areas and drumming logs were accounted for in our assessment. along with important grouse food and cover plants such as vaccinium, honeysuckle, and smilax. Once we identified the release site, we indentified four areas, about 1/8th to 1/4 mile apart, for releases. Our feeling was that it was better not to put all our eggs in one basket, so to speak, by releasing all our hard-earned trapped birds in one spot. Thus, 15 birds were released at each of the first three sites, and 12 birds at the last site.

During the first week in April of 1986, six months after our relocation effort, the entire release area was sampled three times to locate drumming males. Theoretically, one drumming male indicates the presence of one female, but realistically, other factors influence such a population esti-

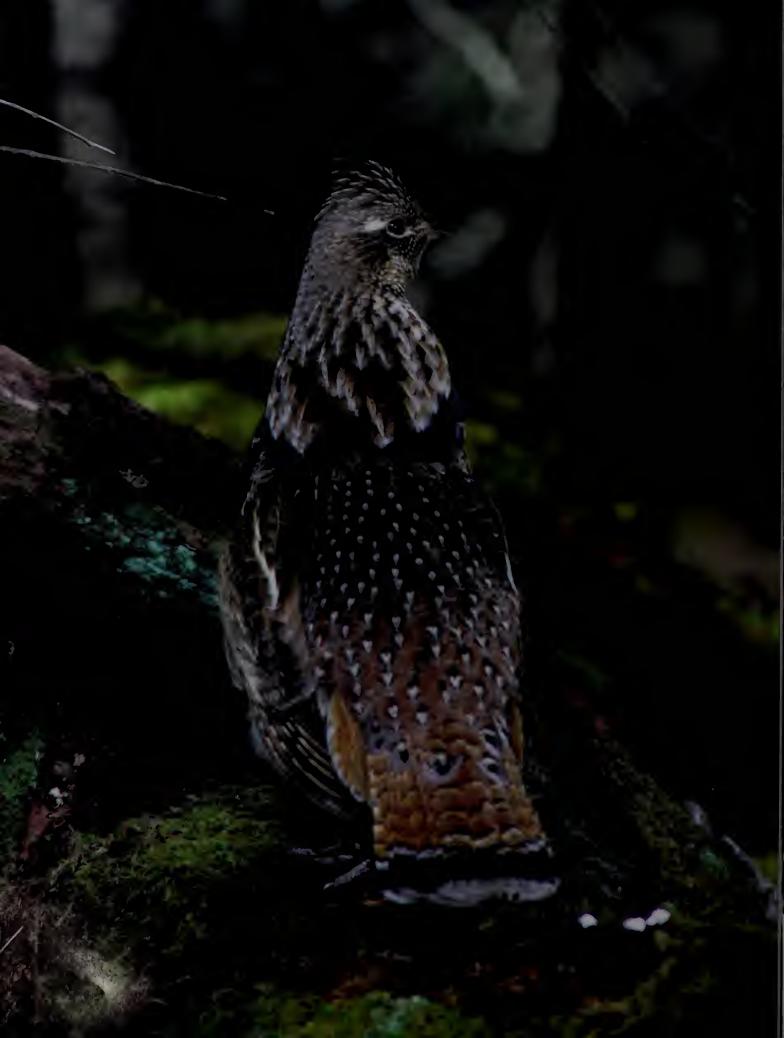


So far, our grouse relocation efforts in Tidewater look promising, with at least one brood reported in 1986. Above and opposite:Brooding hens; photos by Rob and Melissa Simpson (above) and Gregory K. Scott (opposite). Below: Grouse chick; photo by Rob Simpson.



7

FEBRUARY 1988





Drumming logs are important during the spring for male grouse, and Chickahominy Wildlife Management Area has a good number of suitable drumming sites; Above and opposite: Grouse; photos by Gregory K. Scott.

mate. After all, it isn't too probable that we would hear all the drumming males in the area, plus; there may be more than one female for every drumming male. In any case, we located nine different durmming sites in April, though we did not approach the sites for fear of disturbing the birds.

We repeated the drumming census during the first week in April of 1987. This time eight drummers were heard and were located close to the same sites they were heard "showing off"

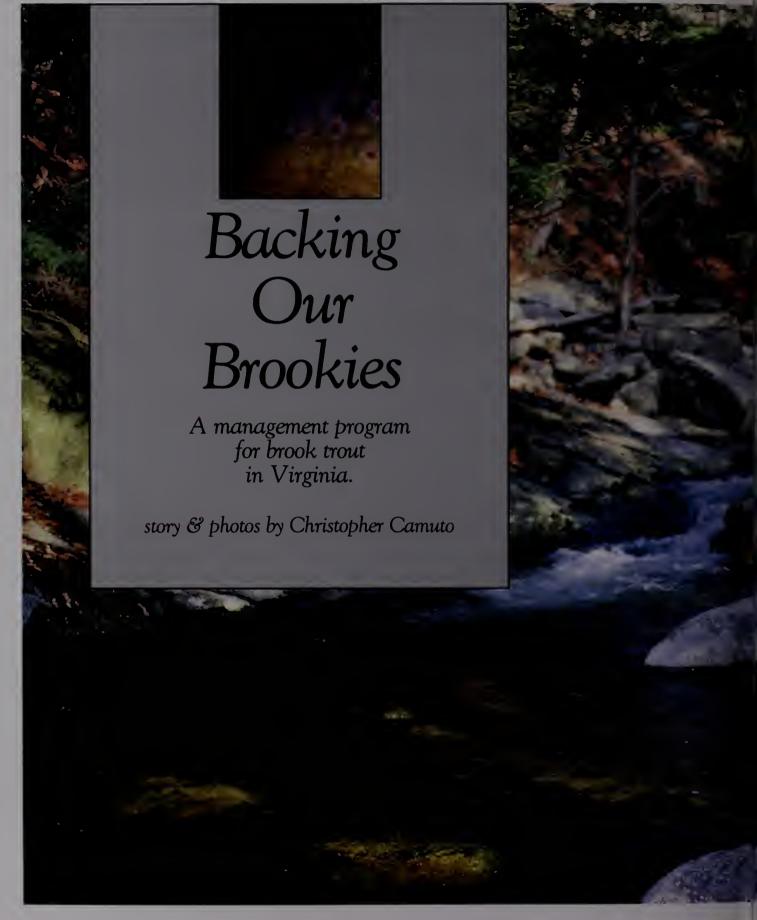
last year.

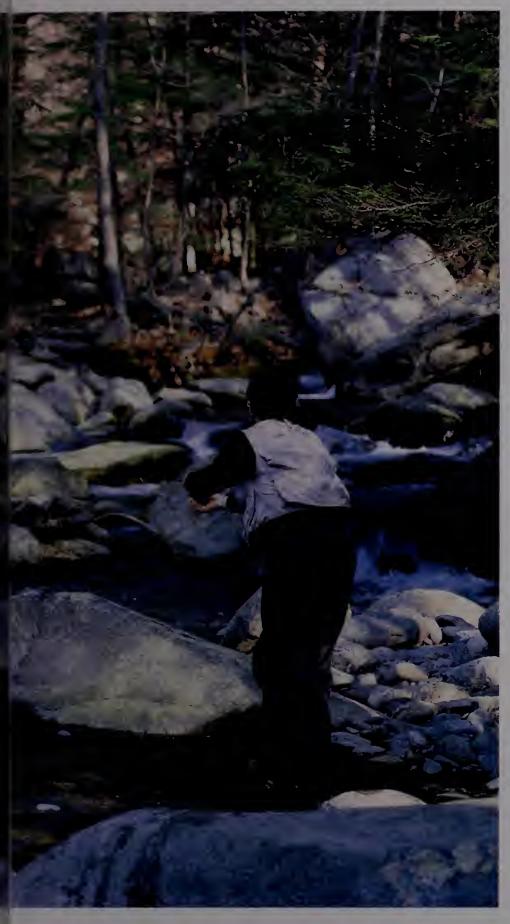
The most heartening discovery is that the birds have been reproducing. One large brood was reported in the summer of 1986, by a visitor to the area, but few had been seen by Game Department personnel. Thus, with the use of dogs in August of that year, we located three broods. The number of chicks in the broods could not be accurately determined, but it appeared that there were less than five chicks in each brood.

Now where do we stand? We have only two years' worth of data from which to make an assessment of the project, but judging from the number of drumming counts and reports from area visitors, the results look encourageing. Based on the brood sightings and the report of the Chickahominy Wildlife Management Area Supervisor David Brime, who saw two unbanded birds at close range, we have established that grouse can successfully reproduce on the area.

To hastily conclude that this experiment is a complete success this early in the game would be a mistake, but so far, the project does appear to be working. It will take at least two years more, or even longer to determine whether or not we have succeeded with this attempt at grouse relocation. But, we have already gained a wealth of knowledge and experience from this effort—and if it works, we may be able to look forward to catching a glimpse of this dynamic bird in Tidewater Virginia. □

Joe Coggin is a supervising wildlife research biologist in the western region. He is heading up the grouse relocation research project for the Department.





ho would have thought that our native brookie, fanning peacefully in a remote Virginia mountain stream, would incite foresters, biologists and fishermen to wear themselves out trying to protect a fragile thousand miles of habitat where these small, but beautiful fish live?

Well, it's true. Known to science as Salvelinus fontinalis, the brookie is perhaps Virginia's most distinguished native species, with a strong claim to a permanent, protected place in our environment. But, with logging, acid rain, and increasing angler pressure on our mountain streams, the management of this our only native trout poses complex problems for state and federal wildlife officials, as well as for citizens concerned about the preservation of Virginia's natural resources.

Until the mid-nineteenth century, brook trout claimed a larger domain in Virginia's rivers than they do today. But, unrestricted logging of Virginia's old growth forests of hemlocks, chestnuts, white oaks, mock-hickories, and tulip trees, conversion of woodland to agricultural use, and the discharge of pollutants raised the temperature and tubidity of many rivers that once supported populations of native trout. A river is only as alive and healthy as the watershed surrounding it, and the brook trout has been retreating before the progress of the axe, the crosscut saw, and finally the chain saw for almost four centuries.

The last bastions of brook trout habitat in Virginia are in Shenandoah National Park, where 110 miles of wild trout water are permanently protected from any encroachment on their watersheds, and in the George Washington and Thomas Jefferson National Forests, where, unless national policy on public lands changes, protection of brook trout habitat will be achieved within the context of the "multiple use" of forest resources.

There are approximately 900 miles of coldwater trout streams in Virginia's two national forests, some of which is exclusively wild trout water, and some of which is "put-and-take" water for hatchery trout. The National Forest Service and the Virginia Depart-



have joint responsibility for the native brookies.

The suitability of Virginia's mountain streams for brook trout has a great deal to do with the fish's natural history. The genealogy of a brook trout holding in the current of a Blue Ridge mountain stream reaches far back into the evolutionary past. One of the successful Salmoniformes, the brook trout's primitive ancestors evolved as a migratory marine species in arctic seas 100 million years ago. Driven south by the cycles of Pleistocene glaciation, the brook trout occupied the cold rivers and shallow estuarine seas that covered Virginia about 40,000 years ago. When the last ice sheet receded from North America 11,000 years ago, the brookies stayed behind, working their way toward higher elevations and cooler water as temperatures warmed. Going "up mountain" was the brookie's only way of going back North.

Ideal brook trout habitat reflects the native's arctic origins. A char rather than a true trout, the brook trout thrives in clean, cold, well-oxygenated water—the kind of water that on the George Washington National tumbles down out of Virginia's mountains. The brookie seeks temperatures

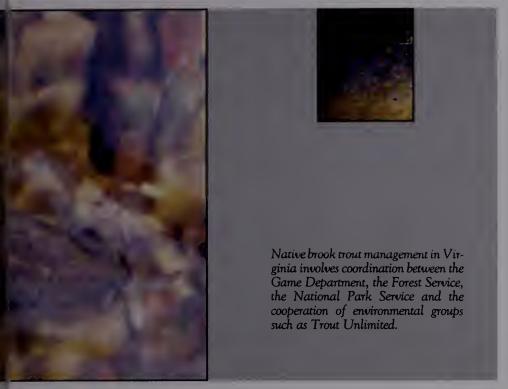
ment of Game and Inland Fisheries below 68°F and needs cool, sedimentfree water in which to spawn. It is sensitive to all forms of water pollution and its reproductive ability is ieopardized by water with a pH more acidic than 5.2. Overhead cover from forest canopy and instream cover from boulders, logs, and aquatic vegetation provide protection from predators as well as the shade that keeps stream temperatures tolerable. The natural sequence of riffles, pools, and deepwater runs of mountain freestone streams provides the kind of streamscape in which brook trout can successfully grow and reproduce.

> The brook trout is a so-called "featured" species in the current George Washington National Forest Management Plan. Recognizing that brook trout are a sought-after game species as well as an ecologically significant indicator species, this program seeks to emphasize the "protection and enhancement" of native trout habitat in addition to providing a relatively undisturbed environment for the fisherman. The program provides special protection for 29 streams and 77.6 miles, or 18% of the coldwater stream mileage

Although work is being done

through the featured species program to improve Virginia's wild trout resource and, in some cases, increase coldwater stream mileage, many of the management practices directed toward brook trout in Virginia's national forests are designed to protect them from the effects of logging and road building. Poor timber practices can quickly destroy a trout stream as well as the wilderness experience many fishermen seek from their days on stream. Since considerable clear-cutting and road building is allowed under the multiple-use policy, trout habitat must be managed defensively. Such management practices include providing filter strips in trout stream watersheds to check erosion and sedimentation and shade strips along stream banks to check erosion and keep water temperatures cool enough for trout. Given the vulnerability of trout habitat, the future of much of Virginia's wild trout fishery will depend on the degree to which the management practices dictated by the current Forest Service plans are carried out in the field.

The Forest Service and the Game Department also cooperate in managing the mix of wild trout and hatchery trout in Virginia's streams. Larry



Mohn, a Game Department fisheries biologist, insists that the Department's primary job in trout management "is to protect existing native resources." In most cases, hatchery fish are not introduced into water with a selfsustaining natural trout population, since rainbow trout (Salmo gairdneri), a species originally imported from Rocky Mountain watersheds, and brown trout (Salmo trutta), a native to Europe and Asia, can in some cases interfere with a brook trout population. Fishing regulations governing catch size, creel limits, and tackle restrictions are designed to encourage the viability of native trout populations.

In addition, cooperation in the protection and improvement of trout habitat in Virginia currently extends beyond official channels. Increased citizen concern with land use practices, increased interest in fishing for wild trout, and increased awareness of environmental problems affecting fish populations has led to greater citizen involvement in fisheries management and habitat protection.

The Virginia Council of Trout Unlimited, which is dedicated to the preservation of coldwater fisheries. and the George Washington and Thomas Jefferson National Forests in a formal Partnership Agreement designed to increase and maintain cooperation among trout fishermen and state and federal fisheries personnel. Although the agreement was signed in January of 1986, Trout Unlimited, the Forest Service, and state fisheries personnel have cooperated on stream improvement projects at least since 1981. Considerable work was done in the aftermath of the November 1985 flood to stabilize stream banks and clear channels on Simpson Creek, North River, Ramsey's Draft, and on the South Fork of the Piney River in Amherst County.

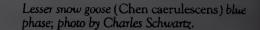
These cooperative efforts to protect trout habitat set a precedent that was formalized in the 1986 agreement. The collective goal is to improve trout habitat, increase public awareness of the value of Virginia's coldwater fishery and the environmental threats, natural and man-made, to that fishery, and to increase funds and labor for habitat improvement work. According to Rich Standage, fisheries biologist for the George Washington and Thomas Jefferson National Forests, has joined with the Game Department the agreement, only the second of its

kind in the country, has already had a significant positive impact on Virginia's native trout fishery. So far, Trout Unlimited has donated several thousands of dollars worth of labor in the construction and repair of habitatenhancing structures on the George Washington National Forest, and plans to increase its on-stream efforts in 1988.

Perhaps the most impressive expression of the current spirit of cooperation and the role of volunteers in resource management was the Virginia Trout Stream Sensitivity Study conducted in the spring of 1987, an effort which brought together academic, state, federal, and private resources. A comprehensive two-year study of the acid sensitivity of Virginia's wild trout water was conceived by Dr. James Galloway of the University of Virginia's Department of Environmental Sciences, and the Game Department agreed to fund the \$70,000 project. Acting in the spirit of the Cooperative Agreement, Trout Unlimited—along with the Float Fishermen of Virginia, Shenandoah Outdoors, and volunteers from organizations like the Sierra Club and the Virginia Wildlife Federation—put more than 160 volunteers in the field and collected samples at 400 sites on 370 wild trout streams during a 10day period in April and May of 1987. A report on the acid deposition problem in Virginia was issued in the fall.

Managing wild trout and protecting the environment they depend upon has clearly come to be a broad-based responsibility in Virginia. If cooperation on the federal, state, and local level continues, and if national environmental problems like acid deposition are adequately addressed, then the continued residency of one of our most distinguished native species will be assured. Hopefully, it will always be possible to spend a day carefully wading a mountain stream, flicking a small dry fly to the likely lies of these wary but hungry creatures, hoping for the sudden rush of color and energy that trout fishermen love.

Christopher Camuto has written for Fly Fisherman, Trout, Flyfishing, and Sierra. He lives in Earlysville.



Stalking

now goose?"
My question was barely a whisper. My guide, hunkered low in the Back Bay blind, glanced quickly at me and turned his head in the direction of my questioning gaze.

"Yep."

The big white bird was directly overhead now, and before I could swing into action it was angling away from the blind, its long, black-tipped wings fanning the misty January air.

I like to take my birds head-on as they approach the blind. I seem to have that shot down pat. Swing on the bird, block out its head with the muzzle of the gun and hit the trigger. Usually a puff a feathers and a big bird hitting the water with a splash is the result, but I had picked up this bird's approach before the guide had and its big white body raised doubts in my mind. Swans are also big and white. They lack the black tips on their wings, but I was having trouble spotting them in the heavy mist that hung over the shallow bay. Whistling swans, or tundra swans as they are called in North Carolina to the south, are illegal in Virginia, and then the big white birds were carrying a \$500 price tag for the hunter who bagged one. I

Hunters are learning fast how to hunt these birds.

the Snow Goose by Bob Gooch

would like to bag a swan, but not illegally. That was why I had hesitated.

Now I was forced to take a goingaway shot, but fortunately the angle of the bird's flight gave me a chance at its head instead of its rear end. I was loaded with high-brass number 6 duck loads, not goose or swan loads, and I needed a head shot. Beyond the shiny muzzle of my battered Browning I could see the bird's long neck and its reddish bill and head. Swinging with the bird I got slightly ahead of it and touched the trigger. The range was short, and the bird faltered and fell like a brick.

'That's just the seventh snow taken from our blinds this season," said the guide as we stood up in the blind and relaxed. "You were lucky a stray came this way."

That statement gave me pause for reflection.

We were hunting the Department of Game and Inland Fisheries Pocahontas Waterfowl Management Area that day, a friend and I. I had been lucky in the drawing for blinds that season and was enjoying the foggy day on Back Bay. It was late in the season. Why only seven snows from this pro- on Back Bay proper, where it had ductive hunting area? Why, I had ended with the duck season. We

never visited Back Bay during the waterfowl season without seeing thousands of the white geese. Admittedly, none had ever come near my blind on previous trips, but they were almost always visible, usually in long, undulating lines—and also high and far

It was not until I met Jim Clark, a Back Bay fishing and waterfowl guide, that I began to solve the riddle. Clark was my guide on one of those Pocahontas hunts. When the talk got around to snow geese, as it inevitably does on Back Bay hunts, he suggested I come back after the duck season closed, and hunt snows with him.

"We'll be field shooting," " he said. "You won't need waders or hip boots."

So that was the answer. While the birds spend a lot of time on Back Bay resting and sleeping, they feed mostly in the fields to the west of the big body of brackish water. This obviously meant hunting private farmlands. I did not have access to such lands, but Clark did.

It was late January when I got back to Back Bay. The snow goose season ran through January that year, except

would not be hunting the bay waters,

It was still dark when, laden with guns, ammunition, thermos jugs, and other gear, we trudged down a long farm road to a ditch that divided two fields. The blind was there—deep in the ditch. We climbed in and awaited dawn and legal shooting time.

The stormy Atlantic Ocean was out there to the east. Invisible, but I could smell it. And out there the gray light of dawn slowly pushed away the blanket of darkness that covered the two fields. Gradually, they took shape and for the first time I saw the big white silhouette decoys. Made of plywood, they dominated the spread of dekes. The decoys took a variety of forms, however, reflecting the ingenuity generated over the centuries by man's attempt to outwit ducks, geese, and other game. In addition to the silhouettes, there were also decoys fashioned from sections of automobile tires. Perfectly formed goose heads and necks had been cut from plywood and attached to the tire sections, and then the whole decoy painted white. The silhouettes and tire decoys were built in Clark's basement, but there were a few full-bodied plastic decoys



that were obviously factory-made. Together, they painted a scene of snows feeding contentedly in the big field.

"That sure ought to bring them in," I whispered.

"Hopefully," came the answer. "But, we could use some fog."

Snow geese were protected for over 40 years, for most of this century, but they were put back on the legal list in 1974. As a consequence, there are not many snow goose experts in Virginia, but those who hunt them are learning rapidly.

The sun was on the flat eastern

horizon now and we had good shooting light.

"Down!" whispered Jim Clark.

I held my breath and waited as a small flock of snows appeared from behind the woods that bordered one of the fields. At first they seemed to be headed for the decoys and our blind, but then veered off.

"Typical. The same old story," I mumbled.

But then another warning. "Behind us!"

I didn't dare risk a glance, but kept my eyes on Clark who had the birds fixed in his gaze. The movement of his



head told the story. Apparently, they were almost overhead.

"Now!"

I swung into position, and it was not until then that I sighted the birds, four of them, eyeing the decoys, and well within range. I picked out a bird and began to swing on it, but it folded as Jim's gun fired. Then there was another, frantically fanning the air for altitude, but my load of 2's caught it before it got far. My partner dropped another, and then I had another shot, missed, swung a bit farther ahead and hit the trigger again. My bird this time.

The quiet that followed was almost

startling, but finally Jim spoke. "Four dead snows out there."

"You need a feeding area and plenty of decoys," Clark said as we climbed out of the blind to recover our prizes. "We were lucky. The birds don't feed in the same place every day. That's one of the problems, but they can rout up a field and it's easy to see where they have been feeding."

Calling also helps, but the better callers use their mouths only to imitate the high pitched yelp of the birds.

Snow geese are not nearly as predictable as Canadas, and they will not stand much hunting pressure. They







may abandon a heavily hunted field. So, the better guides and hunters try to have several locations.

A good feeding area, a blind, and plenty of decoys is one approach to successful snow goose hunting—and calling helps.

Another approach is to locate a flyway close to a resting area so the birds will still be low and within range when they fly out to feed. One good example is the Game Department's Barbours Hill Waterfowl Management Area on Back Bay. Hunters who are successful in drawing blinds there often get good shooting right after legal hunting time, as the birds leave the Back Bay National Wildlife Refuge and head out to feed. This is pass shooting, of course, and it is usually limited to a few minutes each morning. Many waterfowlers bag their first snow geese out of those Barbours Hill blinds.

Incidentally, it is the greater snow goose that taunts waterfowlers over those shallow Back Bay waters. The estimated North American population is between 175,000 and 200,000 birds, and it's growing. These are eastern birds that winter along the Atlantic Coast from southern New Jersey to



North Carolina.

Averaging seven to eight pounds, snow geese are slightly smaller than the better known and more popular Canadas.

There are also a few lesser snows mingled in with the more abundant greater snows of Virginia, but not many. Although the same species, they are a different race of snows, not normally interbreeding because of geographical limitations. The lesser snows are inland birds and their continental population far exceeds that of the greater snows.

While the lesser snows sometimes

appear in dark gray or blue color phases, this is a rare occurrence among the greater snows of the Atlantic Coast. The best place to get a look at a "blue goose" is at Chincoteague, where concentrations of the lesser snows in some years can be considerable.

In any case, we are lucky to be able to hunt the snow goose. Let's hope their populations continue to prosper, providing us with great sport and memorable days, and something wonderful to look forward to next season.

Bob Gooch is a newspaper columnist and contributor to many outdoor magazines.

FEBRUARY 1988 21



On the WILD side

Virginia's Project WILD is bringing wildlife conservation into our schools—and it's fun.

icture this. The gym floor is the Chesapeake Bay. Plankton and detritus cover the floor in the form of tiny squares of colored paper. Mysterious white squares dot the surface, too. Into this ecosystem Susan Gilley sends a flurry of teachers in the form of insects, fish, and osprey.

"How many fish do I have now?"

she asks. Hands go up.

"You're not a fish, you're an insect," one teacher admonishes another.

Then the race is on. First the insects dash in to feed on the plankton, gathering as much confetti as they can in the allotted 30 seconds. Into their orange stomachs (plastic orange bags) goes the confetti. Then the fish dash in, tagging as many insects as they can in the allotted time. The tagged insects must head for the sidelines after surrendering their stomachs to the fish. Then the osprey swoop down on the fish, capturing as many food bags as they can. When it's all over, the surviving insects, fish, and osprey gather in a circle to examine the contents of their bags. It seems they've gathered more than they bargained on, since the white squares were DDT.

"If more than one third of your diet



by Nancy Hugo photos by Cindie Brunner

is DDT, you're dead,'' says Gilley. In this population, only one insect, one fish, and one osprey survive.

Fortunately, Gilley is able to explain that osprey populations in Virginia are actually burgeoning, but the point of the exercise has not been lost: pesticides are dangerous when they accumulate in the food chain.

The activity is called "Deadly Links," and it is one of dozens of activities presented as part of Project WILD (Wildlife in Learning Design), a conservation and environmental education program emphasizing wildlife. The teachers in this case are 5th to 8th grade teachers at Stafford Middle School, and they are participating in an all-day workshop led by Gilley.

"Can you use this exercise in your

classes?" asks Gilley.

"Definitely," is the chorus of replies. A math teacher suggests students could figure the ratio of DDT to detritus and plankton; a P.E. teacher envisions combining the food chain activity with physical exercise; a science teacher thinks this may be the only way to channel energy into the class after a rainy day recess.

Enthusiasm and appreciation are

A teachers group's fantasy bird evolved out of the Project WILD activity "Adaptation Artistry," designed to identify the advantage of bird adaptations and evaluate their importance to the animal.



the hallmarks of the day as Gilley leads teachers through the Project WILD materials. Activity guides will be left with the teachers at the end of the day, and teachers will know how to use them to supplement the classroom curriculum.

With the guides, teachers can choose activities appropriate for each grade level. The activities, which correlate well with the State Standards of Learning Objectives (SOL's), will teach required concepts and skills while at the same time teaching about conservation, wildlife and the environment. Activities like "Grasshopper Gravity" and "Environmental Barometer" can be used in mathematics; "Muskox Maneuvers" and "The Thicket Game" can supplement P.E.; "Adaptation Artistry" and "Forest in a Jar" suit science; and "Shrinking Habitat" and "Classroom Carrying Capacity" complement Social Studies. Activities are also listed by skills, so that a teacher needing to stress evaluation, analysis, listening, inference, or other major skills can select an activity designed to develop that skill. Whatever academic skills the Project WILD materials teach, however, their most important lesson is an appreciation of wildlife and of the environment upon which all life depends.

Consider the activity "How Many Bears Can Live in this Forest?" a favorite of the teachers at the Stafford Middle School. The objective of the activity is to define carrying capacity, but the teachers playing the bears learned more. Each teacher took the role of a bear in search of food on the forest (gym) floor. Colored paper squares represented the bears' food with each color representing the proportion of nuts, berries, insects, meat, and plants in the bears' diet.

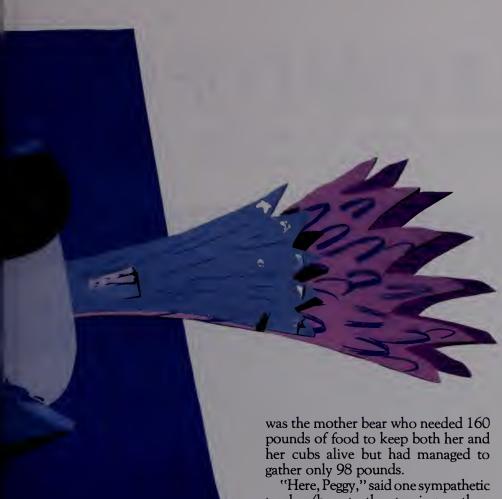
The bears were allowed to walk into the forest, gather food one piece at a time, and return it to their dens (manilla envelopes stationed at the edge of the "habitat"). Gilley pointed out this was clearly un-bear-like behavior since bears would gobble their berries on the spot, but adjustments were necessary for the sake of the game.

The complication factors were these: one bear, blinded in an encounter with a porcupine, would have to search for his food blindfolded. Another bear, injured in a tussle with another male, would have to pretend he had a broken leg and hop on one foot to his

food. A third bear, a mother with two cubs, would have to gather twice as much food as the other bears.

On Gilley's cue and following a few warnings ("No pushing, shoving or running" and "Bears do not steal food from other bear's dens") the food search began. Colored paper squares disappeared like hall passes on Monday morning. Only the injured bears had a hard time gathering their food.

"I'm starving," one remarked in desperation. "I'm not going to live through the year."



He was right. As soon as all the food was gone, Gilley had each bear examine the contents of his manilla envelope. Based on research in Arizona, each bear needed to gather the equivalent of 80 pounds of food to survive for 10 days, but Gilley had put a little less than enough food for each bear on the floor. In this poor habitat, eight bears had not managed to gather enough food to keep them alive for 10 days, and the injured bears had gathered barely enough to make it to

"Here, Peggy," said one sympathetic teacher/bear to the starving mother. "You can have some of the food I gathered."

That un-bear-like behavior became the subject of much discussion, as did Gilley's revelation that a real mother bear would eat first, leaving her cubs what was left.

Gilley explained that she might have further limited the carrying capacity of the land by throwing hula hoops around some of the food to represent shopping centers. Or she might have used white paper scraps to symbolize the styrofoam, plastic, and paper that makes up a part of some bears' diets. The opportunities seemed endless for using "How Many Bears Can Live in this Forest?" as a classroom teaching tool.

less than enough food for each bear on the floor. In this poor habitat, eight bears had not managed to gather enough food to keep them alive for 10 days, and the injured bears had gathered barely enough to make it to mid-week. Most desperate, however, ject WILD activity guides, folders of

instructional material including colorful pictures of Virginia's wildlife, and follow-up newsletters. Not only school teachers, but 4-H leaders, scout leaders and environmental educators attend.

"Anyone who works with kids benefits from the workshops," says Gilley, who emphasizes that Project WILD materials are available only after six hours of training in their use. Gilley, along with volunteer facilitators who have gone through a two-day training process, offer WILD workshops to groups of 20 or more people. An in-service day, a Saturday, or two three-hour sessions after school provide the best blocks of time for teachers.

Funding for the Virginia program is supported by the Game Department's Nongame and Endangered Species Program and the Izaak Walton League of Virginia.

In 1986, the U.S. Fish and Wildlife Service provided monies through the Wallop-Breaux Amendment to the Sport Fish Restoration Act for the development of a Project WILD Aquatic Activity Guide. The guide features 40 new activities dealing with aquatic wildlife species. In addition to the new activities, there are 82 extensions to the original WILD activities. "There's a perfect tie-in with Virginia's emphasis on cleaning up the Bay," says Gilley, who is particularly excited about the new aquatic materials

The Aquatic Project WILD guides will be available through a four-hour in-service teacher workshop beginning in the spring of 1988. The materials will be available along with the other Project WILD materials in extended workshops.

Teachers, administrators, environmental educators and youth leaders interested in a WILD workshop may contact Susan Gilley, Project WILD Coordinator, at the Virginia Department of Game and Inland Fisheries, P.O. Box 11104, Richmond, Virginia 23230-1104; 804/367-1000. Participants are guaranteed a wild—and wonderful—experience. □

Nancy Hugo is a freelance outdoor writer who lives in Ashland.

FAST FOOD FOR

Cedar berries come in handy for migrating birds taking their meals on the wing.

hat pops up beside every new highway, serves low quality food, and is visited by flocks of hungry travelers?

It's the Eastern red cedar—the plant world's equivalent of a fast food restaurant. Cedar trees pop up like weeds along roadsides and in untended pastures, but although we think of them as invaders, they bring riches when they come.

Ćedar berries are an important source of wildlife food, and their evergreen foliage provides important protective and nesting cover. Cedar waxwings, bluebirds, robins, mocking-birds, starlings, and yellow-rumped warblers all feed on cedar berries. Juncos, sparrows, hermit thrushes, mockingbirds and cardinals use them as roosting cover. Chipping sparrows, robins, song sparrows and mocking-birds use them as one of their favorite nesting sites. They are one of the best places to look for long-eared owls in the winter.

Although in times of scarcity deer will browse on cedar foliage, it is the berries that are the tree's most valuable food. "Berries" is actually a misnomer because the fleshy fruits of the Eastern red cedar are technically cones. (Red cedar cones are imbedded in a fleshy growth that looks like a berry.) It is the female trees that bear the blue berries, although now and then a male cedar will have a few berries. The berries are born every year, and every two or three years there is a bumper crop.

The berries mature in September and October—just when many migratory birds arrive. These flocks of avian frugivores (fruit-eating birds) like cedar waxwings can deplete an entire crop of cedar berries in a matter of days, but their impact is much like that of tour buses at the local McDonald's—it's as

26



The Eastern red cedar is an excellent fast food stop for hungry birds on their way south; photo by Rob Simpson.

VIRGINIA WILDLIFE

FRUGIVORES

unpredictable as it is ravaging.

Biologist Anthony Holthuijzen, who did extensive research at Virginia Polytechnic Institute and State University on red cedars and on the birds who feed on them, found that it is not just the flock feeders that are responsible for removing cedar berries; it's regular customers also who feed consistently on the berries. It was single foragers like the yellow-rumped warbler that he observed most often feeding on cedar berries. Resident birds like the downy woodpecker, the Northern mockingbird, and the Eastern bluebird also feed slowly and consistently on cedar berries.

Virginia ornithologist Jerry Via, who kept an injured cedar waxwing in captivity for several months and fed it cedar berries, found that his bird lost interest in the berries after they'd been hit with a heavy frost, and he believes the resinous berries become much less palatable to birds after the first frost. Holthuijzen found, however, that it is in winter that the bulk of a red cedar's fruit crop is removed. Although he observed that flock feeders consume cedar berries in September and October, Holthuijzen found that the bulk of most red cedar berry crops is not removed until late November-January, when other food sources of higher quality have been depleted.

It should come as no surprise to a species that chooses Big Macs over brussel sprouts that researchers have found that factors governing food selection are complex and incompletely understood. It has generally been assumed that animals will unconsciously choose the foods that meet their nutritional requirements, and most reported observations suggest that high quality fruits like dogwood berries (rich in carbohydrates, lipids,



Cedar waxwings (above) and yellow-rumped warblers (below) are two of Virginia's birds that feed on cedar berries; photos by Rob Simpson. Next page: Virginia has no lack of red cedar tree stands, especially at the foot of the Massanutten Mountains in the Shenandoah Valley; photo by Rob Simpson.

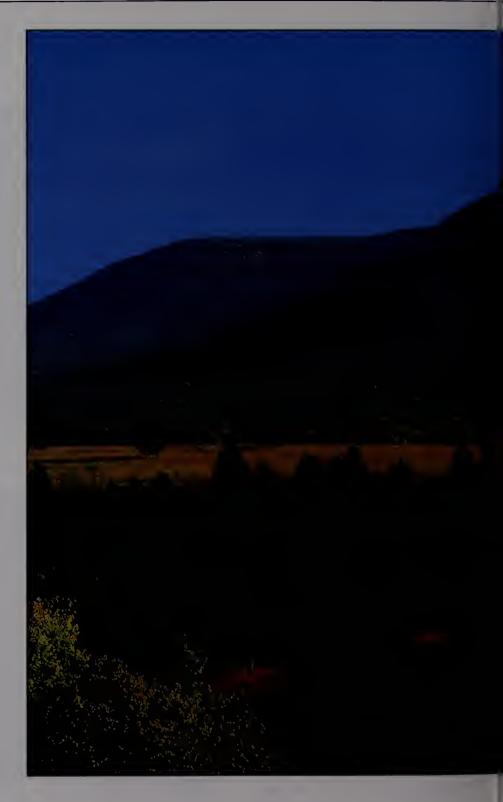


FEBRUARY 1988 27

and proteins) are eaten by birds before low quality fruits like cedar berries. However, when you consider which foods yield the most nutrients per unit search and handling effort, the most profitable fruits are not always taken first.

Just how important a food source cedar berries are was emphasized by William Van Dersal of the U.S. Soil Conservation Service in the 1930s. After his review of several thousand records on plants and animals (including stomach, crop and scat records as well as observations in the literature), Van Dersal compiled a list to represent the "Utilization of Woody Plants as Food by Wildlife." Juniperus virginiana (which is the botanical name for Eastern red cedar), appeared at the top of the list as used by more birds and mammals (71 species) than any other woody plant. That ranking can't be entirely accurate, because foods like "acorns" not specifically identified in the literature were not ranked, and because red cedar is probably overrepresented due to the relative ease of observing animals feeding on red cedars as opposed to other plants, but the listing was enough to suggest that cedars were a more important to wildlife food than previously believed.

Alexander Martin, Herbert Zim and Arnold Nelson compiled a more comprehensive guide to wildlife food habitats in 1951, and their American Wildlife and Plants: A Guide to Wildlife Food and Habits (1951) is still the standard text on the subject. In their star rating system which ranks food sources according to their value to wildlife, cedar (all Juniperus species) ranks eighth among woody plants in a national listing. Only oak, pine, blackberry, wild cherry, dogwood, grape and poison ivy precede it. This is a bit misleading for our area because cedar berries are used more extensively in the prairies, in the Pacific region, and in the western mountain and desert regions than here, but cedar ranks 21st



28 VIRGINIA WILDLIFE



and 24th among woody plant usage in the Northeast and Southeast respec-

Martin, Zim and Nelson identify 44 animals and birds who rely on cedar berries. Cedar waxwings stand out as the gluttons among the group. Cedar berries make up 25-50% of the cedar waxwing's diet, and Holthuijzen found they can consume an average of 53

berries an hour.

Red cedar berries are not only a boon to birds, but the birds help the trees as well. Birds that feed on the berries help disperse the cedar seeds. The typical line of cedars along a fencerow is often "planted" there by birds who fed on cedar berries and then excreted the seeds where they perched. Holthuijzen found evidence that passage through the bird's digestive system actually enhances the seed's germination. Birds are also instrumental in the red cedar seeding of pastures where seedlings often form a "shadow" of decreasing density the farther you get from the parent tree.

Cedars are so easy to grow that they should probably be the mainstay of any landscape designed for wildlife. They will grow in poor dry soil where little else will grow, and they actually improve the soil on which they grow. Researchers have found that worm activity and other beneficial processes increase under cedars, and since their litter is high in calcium, they raise the pH of the soil on which they grow.

Sun is the main requirement. In shade they grow thin and ragged, but in the sun they grow fat and full. Left where they can grow to a ripe old age (sometimes as old as 300 years), they become handsome specimen trees with fluted trunks and beautiful peeling

The next time you see a cedar, give it the respect it deserves. Think of it as a treasure in the landscape, as welcome to birds as a golden arch. □

Nancy Hugo is a freelance outdoor writer who lives in Ashland.

Safety For **Boaters**

by Jim Meuninck

Boaters who fall overboard into cold water, 65°F or less, can survive for surprisingly long periods of time.

Once you hit the water you have two primary concerns: One, avoid drowning until rescued. And, two, avoid hypothermia by lessening the heat wicking action of cold water

against your skin.

By wearing your life vest, of course, you may avoid drowning, but what about hypothermia? Your first judgement call is to measure the swim to safety. If you believe, beyond a doubt, that you can swim to shore, or to your drifting boat with little difficulty then do so quickly as possible. If, however, the distance to safety and the extreme cold of the water makes it suicidal to swim, you must—until rescued—practice one of the following maneuvers to stem the loss of heat from your body.

According to Ron Stewart, M.D. (from the book Management of Wilderness and Environmental Injuries, Macmillian Publishing) you can cut your heat loss in half by folding your forearms across your chest and pressing your upper arms against your sides. Then draw your legs up to your chest and cross your feet at the ankles. Avoid treading water or swimming. This cold water survival posture is called H.E.L.P. (Heat Escape Lessening Posture). It is obvious, in order to maintain this position you must be wearing a life jacket.

We found the H.E.L.P. position difficult to maintain with some types of life jackets. Some life jackets cause you to roll to your chest or stomach, your life vest to determine if it will even when soaking wet.

From the Backcountry

keep your chest up and face out of the water in the H.E.L.P. position.

When two or more persons are overboard in cold water, the Huddle technique may be used to lessen heat loss. First, put your life jacket on backwards so you can hug the other person. Press your chests, groin and legs inward against each other. Place small children in the middle of the huddle. As the name implies, this looks much like a football huddle, but more intimate. Try to make as much body contact as possible. Refrain from swimming and treading water.

As mentioned, H.E.L.P. and Huddle may double your survival time in cold water when compared to merely treading water. The life saving postures decrease body surface area and protect the groin and abdomen.

But, both systems of survival should be practiced beforehand. Once in an emergency situation, no one will be in the mood for instruction. Also, keep in mind that what you are wearing will increase your survival time in cold water. Certainly, high-tech clothing like polypropylene (or thermolactyl, Damart; capilene, Patagonia) long underwear and vapor barrier clothing, covered by a synthetic pile shell will provide additional protection from dunking your head under water (With | heat loss in cold water. On the other your head underwater, heat escapes hand, any fisherman worth his salt will most rapidly from your head into the be wearing an uncombed, oily, virgin water, thereby defeating the purpose wool outer garment. Now, there's an of H.E.L.P.). So, be certain to test old time remedy that holds in the heat,

Oops!

In the October 1987 issue, we incorrectly credited Lynda Richardson with the photo on page three. Our apologies to the photographer, Kevin D. Shank, for the mistake.

Upcoming Hunter Education Classes

Below are the hunter education classes being offered this month as of our press date. However, some classes may have been added to this list since that time. Call the Game Department, Hunter Education Information, at 804/367-1000 for more details.

The courses offered below fulfill the current mandatory hunter education requirement for all new hunters and those 16 years of age and younger.

District 1—Central and South

Central Virginia

Location: Chesterfield Court House. Central Library

Date: February 16, 17, 18 Time: 6:00 - 9:30 p.m.

Contact: Chesterfield County Parks and Recreation Department

Phone: 804/748-1623

Location: Rescue Squad Building, **Powhatan**

Date: February 27 and 28 Time: 9 a.m. - 4 p.m. and

2 p.m - 6 p.m. Contact: Bill Britton Phone: 804/379-1364

District 4—Northwest Virginia Location: War Memorial Building, Madison County

Date: February 7 and 14 Time: 1 p.m. - 6 p.m. Contact: Steve Hoffman Phone: 703/948-4453

Planting for Wildlife

by Nancy Hugo

One of the first things we did when we moved into our house was to cut down the brier bush next to the front porch. Surely anything so thorny was a weed, and a good gardener would want to get rid of it. It wasn't until several years later that I realized I'd cut down a Japanese barberry, a shrub that's not only of value to wildlife, but a beautiful garden shrub as well.

Fortunately, nature recovers from our mistakes, and my barberries have grown back. At the moment, they are a dense tangle of thorny branches with delicate tear-shaped red berries and a few crimson leaves leftover from fall. They're particularly beautiful in the snow because the stems bear the weight of the snow and the red berries hang like jewels beneath them.

It seems inconceivable to me now that I ever wanted to get rid of my barberrry, but often when we're "cleaning up," thorny plants are the first to go. If we considered their value for wildlife cover and nesting sites, they might be the plants we value most.

"The gardening slob is the bird's best friend," I read in a gardening book once, and the author made a case for letting more of our ramblers and thorny hedge plants grow without pruning them. There's some truth to that because we often ruin the value of our shrubs for wildlife by clipping them before they can bloom and set seed or by clipping them so severely they become impenetrable. Barberries and other thorny hedge plants will offer the greatest value to wildlife where they can be left to grow with as little pruning as possible. Actually, the barberry's natural shape is beautiful, and judicious pruning will easily keep it in bounds.

Berberis thunbergii, the Japanese barberry, is a deciduous shrub with yelto returning migrants. The European



low wood that usually grows to about five feet. In the spring it has bright green foliage and dainty yellow flowers. The stamens of the flowers are sensitive to touch and will spring toward the center of the flower if you—or a bee—touches them. The shrub is native to Japan but has naturalized here where it can be seen growing along roadsides, in pastures, open woods, and gardens.

The barberry is not only great as a hedge plant, but it's good for corners and as a filler shrub in the border. Barberries will put a stop to pedestrian traffic wherever they grow, because the branches are not only thorny, but they're closely spaced—the very reason birds love them so. They're fastgrowing (three years after I cut mine to the ground, they were back to their original size, about four feet), and they're easy to grow. "If the Japanese barberry won't grow in a trying spot, no other woody shrub will," writes Wyman in his gardening encyclopedia. They'll grow in poor soil and although they prefer full sun, they do fine in partial shade.

Mockingbirds, waxwings and sparrows eat the bright red fruits in winter, although many of the fruits can still be found clinging to the plants in the spring. Sometimes they provide food to returning migrants. The European

barberry, B. vulgaris, and the Darwin barberry, B. darwinii, reportedly have greater appeal to birds as food than the Japanese barberry, but B. vulgaris is one of the most susceptible of the barberries to a wheat rust that's a bane to grain farmers. There are also several varieties of evergreen barberries.

Another member of the barberry family of value to wildlife is the Oregon grape holly or *Mahonia*. It's a beautiful shrub that has no thorns but it does have intimidating spines on its glossy evergreen leaves. Bees love its Mayblooming clusters of small yellow flowers, and many small birds and mammals eat the grape-like black fruits that ripen later in the summer. Its dense foliage provides protective cover.

Mahonias prefer moist acid soil, and they thrive in the shade. They are one of the few shrubs that enjoy the company of walnuts.

Both barberries and mahonias can be propagated from seeds or from softwood or hardwood cuttings. It's also easy to divide mahonias with a sharp spade. Young plants are available at most nurseries. Once the plants are established, birds will spread the seeds, and you'll find new plants popping up all over the yard. Fight the urge to remove them, and the birds will thank you for it. \square

Letters

December Editorial

It's been two weeks since I received my first copy of *Virginia Wildlife* and my concern for sensible hunting and sane hunters hasn't abated.

How many animals are killed needlessly? How many nincompoops are adequately trained or self-educated to use weapons? How many cows, automobiles, no hunting signs, as well as barns (not to mention hunters) are shot every year?

It seems frivolous to me to introduce a magazine dedicated to hunting with a discussion of "proper attire" when there are important issues about life, safety, sanity and respect for mother nature.

I work for the ski patrol at Massanutten and find the "ski set" more polite, more conscious of safety, and more sensible than most of the hundred of hunters that have violated our no hunting signs, trespassed, shot holes in my car and barn and generally either have been rude or devious when confronted.

Len J. Madison

Your most recent editorial (December, 87) hit the bull's-eye again. You

really do have a gift for writing in that rare fusion of both the professional and the personal. Perhaps you are so able to do this because your professional opinion is backed by your personal experience. Whatever the reason, I hope you continue to instruct us all so gently and persuasively.

Gerald P. McCarthy
Virginia Environmental Endowment
Richmond

Tribute

Your October 1987 cover editorial tribute to Latane Trice was an excellent testimonial to a personal friend and neighbor. Your message to the readers about the tradition of "Brother Latane," as he is known to many of us in King and Queen, reflects quite accurately many of the traditions of Southern hospitality, good sportsmanship and love of the land that he has tried to live by and instill into the younger generations.

Robert Shackleford, Jr. Newtown

A New Idea

I believe there is a means to substantially increase the number of subscriptions to *Virginia Wildlife*.

I became acquainted with Virginia word."—Editor

Wildlife during a visit to a doctor's office. A copy of the publication was available on the magazine table. This was many years ago and I have suscribed regularly ever since. Recently, I began saving a few copies in order to have a few on hand should a neighbor child need reference for a composition at school or if I visit a doctor's office and not find a copy of Virginia Wildlife available in the supply of magazines. I not only mention the availability, but I hand him a copy and make sure there is a subscription form included. You would be surprised at how many are not only receptive but appreciative.

You have a tremendous publication and one that is very much in need as a means to promote conservation of our resources and respect for life that is in danger of being eradicated in some instances. I know of no magazine that does more to build respect for these creatures of the wild than does this type of publication. I feel very sure there are many people who would be glad to help in this way if it were but suggested to them.

Fred Molzhon Newport News

Thanks so much for "spreading the word."—Editor

13th Mid-Atlantic Wildfowl Festival

- · Art, Carvings and Photography
- •\$8000.00 Carving Competition
- · Auction
- · Buy, Swap and Sell Area
- Duck and Goose Calling Contest with Prizes-\$1200.00
- Friday: Hands-on Decoy Painting Seminar-by Jim Sprankle
- Saturday: For Children 12 and under: FREE Decoy Painting Seminar with decoy and materials furnished. Co-sponsored by The Virginia Department of Game and Inland Fisheries.
 - · For information contact:

Dr. C. Alison Drescher 105 N. Plaza Trail, Suite D-5 Virginia Beach, Virginia 23452 (804)481-5157, (804)340-1153







Striped Bass Cookery

by Annette Bignami

This is the season to catch striped bass in our lakes, and more than few of us might need to know what to do with the "little ones" that don't end up on our walls. Annette Bignami shares some ideas:

Cook's Treat Stripers

1/3 pound fish fillets or steaks per person*
1 cube butter or margarine, melted
1 medium onion, chopped
3 stalks celery, diced
1 tsp. each of thyme, sage and parsley
1 cup raw rice (makes 2 cups cooked)
1 small can green olives, drained salt and pepper to taste
*rest of ingredients serve 4

Set oven at 350 degrees. Fillet or steak striper one-half to one-inch thick. Then wash and pat dry with paper towel. Steam or boil rice. Melt butter or margarine in a skillet and saute' onion 5 to 7 minutes or until tender. Add celery and saute' 4 minutes more before stirring in cooked rice and and seasonings with a fork so rice stays fluffy.

Either move ingredients to buttered ovenware or simply put the skillet in oven after adding single layer of fish and topping with olives.

Cover with foil and cook in 350 degree oven for 20 minutes or until fish flakes with a fork. Serve with vegetable and salad. Leftovers can be reheated for the next day's lunch.

Stripers in Red Wine & Mushrooms

1½ pounds leftover poached or baked striper fillets

3 tablespoons butter or margarine

1 medium onion, chopped

1 cup fresh mushrooms, sliced

3 tablespoons flour

1 garlic clove, minced

1 cup fish stock or clam juice

2 tablespoons tomato paste

1 cup red wine

2 tomatoes

4 or 5 potatoes, boiled and mashed for piping

3 tablespoons butter or margarine for topping

1/4 cup bread crumbs parsley to garnish

Cut striped bass into one-inch chunks. Melt butter over low heat and add onion, cover and cook 2 minutes. Add mushrooms, raise heat and cook until tender. Remove pan from heat, stir in flour, garlic, stock or clam juice, tomato paste and salt and pepper to taste. Bring to a boil, lower heat and simmer 3 minutes. Reduce wine in a separate saucepan to one-third cup, then stir into sauce. Peel, quarter and boil potatoes, then mash with butter and a little cream, Add striper to stock pot with wine. Simmer 5 minutes. Slice tomatoes into 8 wedges. Add to pot and toss until well coated.

Heat oven to 400 degrees. Spoon fish and sauce into individual baking dishes or scallop shells. Pipe hot mashed potatoes around edges. Melt remaining butter and quickly brown bread crumbs. Sprinkle on fish, garnish with parsley and set dishes on a baking sheet to catch spillovers in the oven for 5 to 7 minutes. We serve this with green beans, homemade soda bread and coffee cream parfaits for dessert.

Consider the fisher. They're so unknown to most of us that we feel just about as comfortable discussing a tree hyrax. Even the name fisher is strange. A student asked me, "Why fisher—Does it feed on fish?"

The average fisher probably never sees a fish in its lifetime. I found in a publication by fisher specialist Roger Powell that though the origin of the common name, fisher, is unknown, chances are Dutch settlers noted the resemblance of the fisher to the dark phase of the European polecat. Among the names for the polecat are fichet, ficheus, and fitchew—derived from a Dutch term meaning nasty.

Like the European pole-cat—which is our pet shop "ferret," the fisher, Martes pennanti, is a member of the carnivore family Mustelidae. Along with skunks, weasels, minks and river otters, the fisher is one of seven species of mustelids in the Commonwealth.

Too, like other members of the family it possesses anal glands that produce odoriferous secretions for marking territory and communication—but not for the spraying kind of protection that has reached its maximum extreme in skunks.

Although an adult male fisher is about fox-size, it has the nearly ground hugging build of most members of its family, but not as highly pronounced as in the highly carnivorous weasel. The fisher, both in form and function, is more of a generalist than the weasel and is at home in burrows, on land, and in the trees.

Items in the fisher's diet are variable and include

$V \cdot I \cdot R \cdot G \cdot I \cdot N \cdot I \cdot A' \cdot S'$

The Fisher

by John Pagels photo by Leonard Lee Rue, III

$W \cdot I \cdot L \cdot D \cdot L \cdot I \cdot F \cdot E$

The snowshoe hare is extremely rare in Virginia, but to the north where it is more abundant, the snowshoe hare is common prev of the fisher. But talk about sore gums! The fisher is among the very few mammals to prey on the porcupine. The porcupine doesn't occur in Virginia but it's an interesting story. The agile, short-limbed fisher repeatedly attacks the head area of the porcupine where it lacks quills. Both are good climbers, and in tree situations, the fisher often attacks from above. When the porcupine dies of shock or blood loss, feeding begins from the ventral side, also devoid of quills and the fisher neatly "skins" the porcupine from the inside while consuming all but the largest bones and a few other parts.

According to Powell, the average fisher eats the equivalent of from one to two squirrels or seven to 22 mice every day. As you would expect, there are very few fishers per unit area. Probably only about one per every five to 10 square miles. Fishers are solitary animals.

Certainly, a couple of adult fishers have to get together at least once a year. As a result of that, one to five (usually three) kits are born in the spring. The kits are very dependent on the mother for several months, but at about five months the young disperse as the result of intrafamilial aggression. And mom is alone again for the winter. Pop is alone and probably far away. And so are the young.

Like several other kinds

of mammals that have life styles that keep them greatly spread out for most of the year, the fisher has a special reproductive strategy. It involves the female being pregnant for about 350 days a year, including the time that she is nursing and caring for a litter.

Fishers mate only a few days after giving birth, but the zygote develops only to an early stage known as the blastocyst, which consists of only a few hundred cells. Growth of the blastocyst is arrested for 10 months or more, and it floats around in the uterus until late winter until it finally implants and development ensues in a typical mammalian fashion. About 30 days after implantation the young are born and we're back at the beginning of the story.

But why such a special strategy? Why not mate in late winter? Well, think about hanging around with a partner in the winter and having to come up with about 40 mice every day. Or 40 squirrels every 10 days. Another hint. Think about the end of a long, winter. It's still cold, the animals are thin and hungry, the prey population is low, but the males and females still have to find each other. After all if they didn't mate, then the young would be born too late in the spring to grow and prepare for winter.

Now it's clear. They don't have to mate too early, or later because the female is already pregnant—has been for almost 10 months or more. Another of the neat adaptations up Mother Nature's sleeve. □

John Pagels is a biologist at Virginia Commonwealth University who specializes in Virginia mammals.



